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percent of the total molding in 1945, to 65 percent in 1946. Up to 20 percent of the steel castings are now made with easily removed dead heads. As a result of these advances in molding and casting, the output of sound steel castings rose from 40.4 percent in 1940 to 52.7 percent in 1946, with rejects during that period being reduced from 13.8 percent to 6.6 percent. The cost of one ton of steel casting was cut nearly 50 percent.

Many of the changes made at the plant during reconversion were carried out on the recommendations based on time and motion studies made by mixed brigades of specialists comprising technicians, foremen, industrial engineers, economists, and others.

In December 1946, the first mixed specialists' brigade began its work in the core-making section of the steel-forming shop where there was an absence of detailed planning, backward technology, and an inadequate supply of tools and attachments. The core boxes, for the most part, stood on the floor so that workers had to bend over them. Equipment was arranged without regard for economy of movement. For example, the boxes containing molding mixture were situated 6-7 meters from some of the work places.

It was estimated that for the preparation of one core, having a completion norm of 18 minutes, a core worker had to move a distance of 100 meters, carrying materials and performing other preparatory operations. Tools were in poor condition; smoothers, lances, and tampers were not always true, and pneumatic tampers were lacking. The section was littered with broken boxes, used sand, etc.

Consulting with Stakhanovites and foremen, the brigade worked out a plan for reorganizing the section into a so-called "high-production" area. The basic operations were turned over to qualified core men, subsidiary and simple operations to unskilled workers. Work was specialized, and a closed-production cycle was created. Time spent on one core was cut from 893 to 265 seconds, and the distance covered by workers in obtaining material and equipment was cut 90 percent.

The new organization did not require capital expenditure; it was carried out mainly through elementary mechanization and equipping the working area with suitable tools. The 87-percent growth of labor productivity attained in 6 months of 1947 is not the limit; the plant expects to raise the productivity of labor 50-60 percent more.

Data observed by the brigades showed that institution of high-production methods of labor under conditions of individual and small-series production is the most effective means of raising the productivity of labor. It was accordingly decided to create ten additional high-production sections.

The brigades proceeded to study the sections' working conditions, and to work out organization-technical plans for them. The high-production sections were specialized according to the shops in which they were located.

In the press shop, introduction of high-production methods for the light-press section was begun with a rearrangement of its floor space, and general cleaning. Racks and boxes for tools were disposed at convenient places about the shop, making it possible to work without losing time in searching for tools.

To increase the productivity of the press forges, the disposition of the hoist and transport equipment had to be changed. Thus, for example, the traveling bridge crane at the end of the aisle was moved to a locus between two presses. This permitted the forging crane to be freed from performing auxiliary operations, and increased the productivity of both presses.

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The transport of hot ingots and finished forgings along the light-press section constituted a bottleneck for a long time. An electric tow car working here could not handle the weight and frequently broke down. Besides, it moved very slowly; time was wasted, as well as gas for reheating the cooled ingots, and the presses were held up waiting for the ingots. A change in the design of the electric tow car, increasing its speed and load capacity, liquidated the losses and broke the bottleneck.

Setting up the operational-planning section of the plant also had a great influence on increasing productivity. Formerly, the size and shape of the forgings was not taken into account in planning, making it necessary to carry out several changes in the positions of the tools during the shift. Now, before giving the task to the section, the distribution-planning office of the shop assort the forgings according to types and sizes. This newly organized planning sharply cut down the expenditure of nonproductive work time.

The forge technicians actively participated in the effort to create a high-production section in the press shop. By establishing optimum dimensions for the forgings, they were able to reduce the number of reheatings, and to eliminate unnecessary operations. In addition, the technicians developed several new devices for turning out heavy forgings, including one for forming turbine disks, and a power plunger used in forming hollow centers in cylindrical billets. Plans call for pneumatic devices to hold the ingots during forging. There will be an increase in the park of heavy tools, a great many of which were worn out or damaged during the war.

In the assembly shop, the mud-pump section was put on a high-production basis. The assembly of the pumps was divided into a number of operations corresponding to the number of units. For each of the 11 units, a special work space was established, equipped with the necessary devices and hoists. At every work space, workers were assigned whose qualifications corresponded to the complexity of the task. They worked on the new principle that operations in the assembly of the same unit were technologically identical.

The assembled units go into stock, from which the over-all assembly is fed, with the units riding an assembly line having seven stations. One brigade per shift serves each station.

To speed up the stroke of a hydraulic press, the diameter of the opening for the water outlet was enlarged and a return spring inserted. This cut the time of each stroke 25 minutes [sic]. A device for boring holes in flywheels of mud pumps reduced labor expenditure 4 hours for one pump.

The planning-dispatcher division developed cyclical schedules for manufacture of parts, insuring an even supply and smooth flow of work.

The creation of a high-production section for assembly of mud pumps raised the productivity of labor 70 percent in 7 months.

Similar measures were carried out in section No 5 of the drilling-machine shop, where 35 different parts were manufactured.

The cutting laboratory worked with the sections' technicians in effecting the application of the latest devices in the field, including cutters with Pobedit coatings and negative rake-cutting angles, and special measuring devices which reduced the time of checking operations. Several machine tools were specialized and changed over to work on a single operation, thus raising their productivity. Boring and turning lathes were equipped with attachments permitting the use of two-cutter heads.

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High-duty special reamers were put into operation. The application of broaches for making openings, slits, and keyways raised the productivity of labor several times in comparison with old methods.

Simultaneously with the improvement of shop technology, the operational time-scheduling and accounting methods were radically changed. In the process of organizing high-production sections for the shops, a new system of planning was introduced, embracing all basic sections and subsidiary links in the shop. On the basis of the plan given to the sections in monthly and daily form, shift and monthly tasks are assigned the foremen and individual workers. In each sections, everyone, from the senior foremen to the workers, has a concrete task.

The system of work accounting developed for the shops makes it possible to check the progress of any worker, noting the degree of fulfillment of the assignment at the conclusion of each shift.

At present, there are 21 high-production sections in the plant. The plant will soon proceed from high-production sections to high-production shops. Stakhanovite councils are working with the plant director and shop foremen to raise labor productivity.

Figures on the high-production sections show the vitality and effectiveness of this form of labor systematization. In the first 6 months of 1947, productivity increased considerably over that of 1946. In one section of the excavator machine shop, productivity increased 71 percent, in a section of the foundry it rose 87 percent, and in a section of the cleaning room it rose 180 percent.

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